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SNOW SURVEYS AND IRRIGATION WATER FORECASTS U. S. DEPARTMENT OF AGRICULTURE

for the
RIO GRANDE DRAINAGE BASIN

May 1, 1943

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Issued by the
United States Department of Agriculture
Soil Conservation Service
Division of Irrigation
In Cooperation with
The Colorado Agricultural Experiment Station
Colorado State College
Fort Collins, Colorado

May 10, 1943

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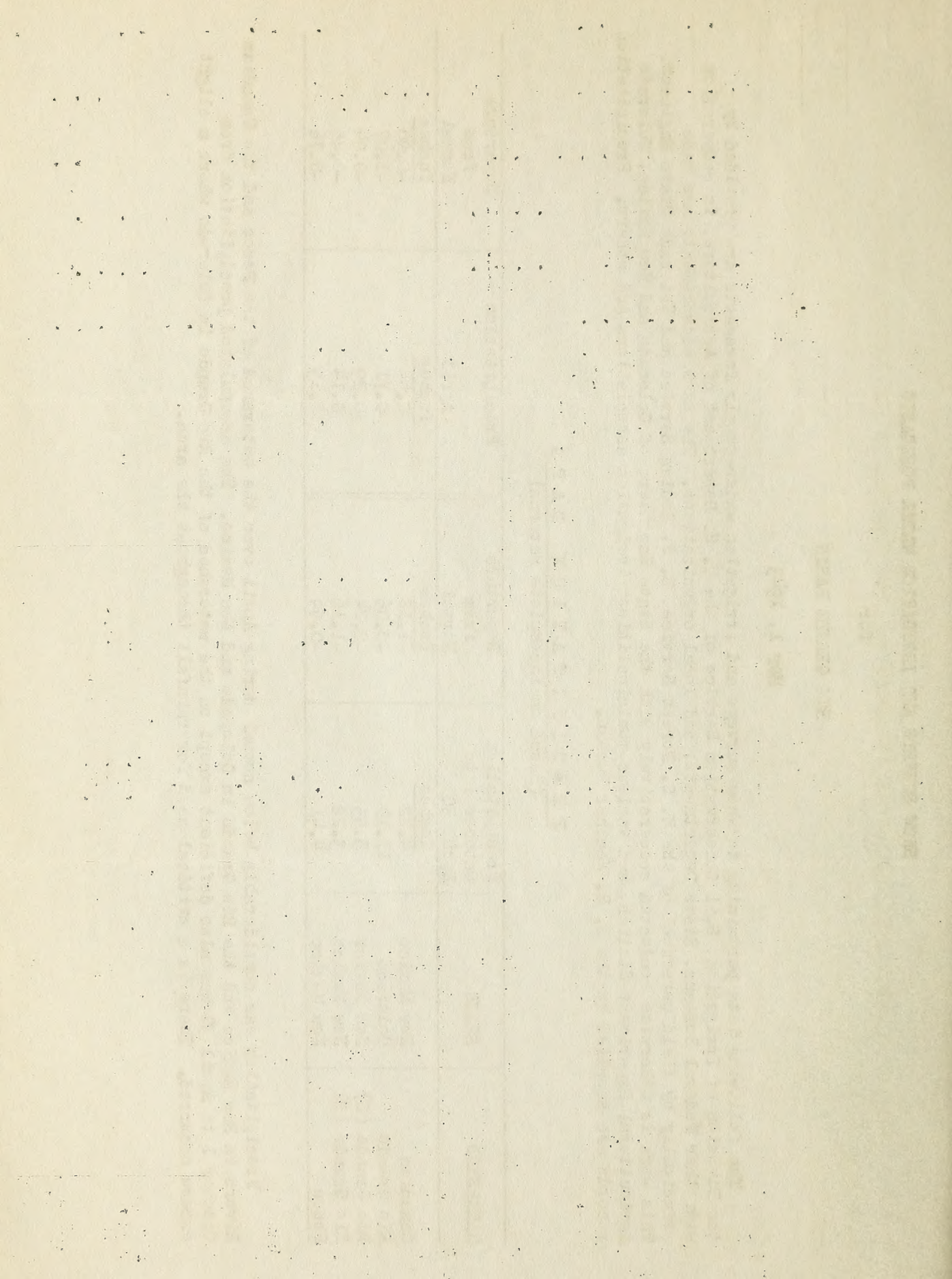
The following data pertaining to snow surveys and irrigation water-supply forecasts are provided by the Division of Irrigation, Soil Conservation Service of the U. S. Department of Agriculture, in cooperation with other Federal Bureaus, State Departments, and local organizations. The snow measurements are made principally by field personnel of the U. S. Forest Service, U. S. Indian Service and Colorado State Engineer. This work is otherwise conducted cooperatively with the State Engineers of Colorado and New Mexico, Colorado Agricultural Experiment Station, and various municipalities, irrigation associations and others. Precipitation records are supplied by the U. S. Weather Bureau.

P R E C I P I T A T I O N D A T A

(Based on incomplete returns)

WATERSHED	STATE	Precipitation October 1 to April 30	Departure from Normal	Precipitation		Departure from Normal
				April	Inches	
Canadian	New Mexico	Inches 4.22	Inches -1.18	Inches 0.44	Inches -0.90	
Rio Grande	Colorado	11.10	+0.06	0.71	-1.07	
Rio Grande (N)	New Mexico	5.55	-2.24	0.29	-0.94	
Rio Grande (S)	New Mexico	3.28	-1.16	0.14	-0.45	
Pecos	New Mexico	4.41	-0.99	0.19	-0.76	

Precipitation was considerably below normal during April over the watershed of the Pecos and the Canadian Rivers in New Mexico and the Rio Grande in Colorado and New Mexico. The accumulated precipitation from October 1 to April 30 was also deficient except on the watershed of the Rio Grande in Colorado where a slight excess occurred. There is a critical need for rainfall throughout the area.



SUMMARY OF MAY 1 SNOW SURVEYS AND COMPARISON OF DATA WITH THAT OF PREVIOUS YEARS BY WATERSHEDS

WATERSHEDS	Snow Depth			Water Content			Number Courses in Average			Snow Density			1943 Water Content in percent of	
	Seven year Avg.*	1942	1943	Seven year Avg.*	1942	1943				Seven year Avg.*	1942	1943	Seven year avg.*	1942
	In.	In.	In.	In.	In.	In.				Percent	Percent	Percent		
Rio Grande	23.8	34.6	11.3	9.8	13.1	4.9	9			41	38	43	50	37
Canadian River	--	--	--	--	--	--	--			--	--	--	--	--

*Some for shorter periods

WATER SUPPLY OUTLOOK

Rio Grande. The May first snow surveys show an average water content of only one-third of that of a year ago on the headwaters of the Rio Grande in Colorado and but one-half of the past seven year average. Because of the exceptionally deficient April precipitation throughout the Rio Grande drainage, together with above normal temperatures, many of the snow courses which under usual weather conditions would have had measurable depths of snow on the first of May are now bare. During the month the water content of the snow pack on Wolf Creek Pass was reduced by about 15 inches through melting and evaporation, at Cumbres Pass about 12 inches and at Summitville, elevation 11,500 feet, 4 inches. The early snow melt has resulted in above-normal run-off in the upper reaches of the main river and its tributaries.

On the Rio Grande, in northern New Mexico, the April first water content of the snow has for a number of years averaged about 6 inches, but because of the combination of subnormal precipitation and melting temperatures the snow cover throughout this area was substantially depleted during the past month except for a few remaining drifts which are quite negligible as a factor affecting the final run-off from this section of the watershed.

The present outlook for the coming season's irrigation water supply, as based on the snow cover on this drainage, is less favorable than it was a month ago. Reservoir storage in the San Luis Valley has not kept pace with the season due largely to an early demand for direct irrigation water urgently needed in supplementing the soil moisture over the cultivated areas of the valley. It is expected that the final limit of storage this season will somewhat exceed the present level but will not reach last year's fillings. The peak run-off will be early this season. The snow cover at the high elevations is comparatively good at this time, a condition which should maintain the river at a fair stage well into the summer. Range conditions are fair to poor over the entire drainage area.

Storage in the Elephant Butte and Caballo reservoirs now totals nearly 1,900,000 acre-feet or about 75 percent of capacity. El Vado Reservoir on the Chama held 127,000 acre-feet on May first, an accumulation of 70,000 during April, and now is nearly 60 percent of capacity.

Canadian and Pecos Rivers. For these drainage areas the run-off from snow cover will be much below normal. However summer flood flows may add materially to the water supply. The present storage in the Conchas Reservoir is 390,000 acre-feet or two-thirds capacity. Soil moisture conditions are poor over the Canadian drainage and because of deficient rainfall the range conditions are also poor. For the Carlsbad area on the Pecos the storage in the principal reservoirs is about two-thirds of that of a year ago and also approximately two-third capacity. Soil moisture conditions are poor and the range dry.

Groundwater. During 1942 the water levels rose in the Roswell Artesian Basin of the Pecos Valley except in the irrigated area where there was a drop of 4 or 5 feet. Shallow water levels fell in the heavily pumped area of the basin, falls of nearly 8 feet occurring in some wells. Changes in the water levels in the House Area on the Canadian vary from a fall of one foot in the trough of the valley to a rise of one foot in the wells farthest from the river. Water levels fell from 1 to 4 feet in Portales Valley and a similar drop occurred in the irrigated area of Mimbres Valley. There was little change in Estancia Valley and Mesilla Valley. In the San Luis Valley surface water levels are reported to be higher than usual.

RESERVOIR STORAGE

Reservoir Storage in Thousands of Acre-Feet, Rio Grande Drainage, as of May 1, for the Years 1934-1943, inclusive. (Based on data from the State Engineer of Colorado, U. S. Bureau of Reclamation and other agencies).

A = Percentage of capacity. B = Percentage of 10-year average. C = Percentage of filling forecast for 1943.

Reservoir	Capacity Ac-ft.	1934 Ac-ft.	1935 Ac-ft.	1936 Ac-ft.	1937 Ac-ft.	1938 Ac-ft.	1939 Ac-ft.	1940 Ac-ft.	1941 Ac-ft.	1942 Ac-ft.	1943 Ac-ft.	10-yr. Avg. \bar{p} Ac-ft.	A %	B %	C %
RIO GRANDE DRAINAGE															
Rio Grande	45.8	4.9	0.3	23.6	16.2	17.5	36.7	4.7	8.4	49.1	7.8	16.9	17	46	20
Santa Maria	45.0	6.8	4.6	6.9	9.5	10.8	15.1	3.8	4.6	26.9	15.4	10.4	34	148	40
Sanchez	25.9	12.0	7.4	13.8	17.6	19.2	22.9	10.9	8.6	37.9	35.0	18.5	135	189	100
Terrace	17.7	1.4	1.3	6.4	4.5	9.6	7.5	1.7	3.8	9.1	1.3	4.7	7	28	30
Continental	26.7	2.6	0.8	3.3	0.5	4.0	4.3	1.0	6.0	10.0	16.2	4.3	61	377	65
Elephant															
Butte	2273.7	1001.6*	488.0*	782.5	917.1	1099.0	1324.0	803.2	598.5	2126.0	1653.1	1079.3	73	153	80
Caballo	365.0	--	--	--	0.0	14.5	44.5	17.3	67.8	263.1	238.3	107.6	65	222	80
El Vado	226.0	--	--	--	--	148.6	87.4	113.7	129.8	155.5	127.0	127.0	56	100	70
CANADIAN DRAINAGE															
Conchas	600.0	--	--	--	--	--	--	80.6	155.5	390.6	390.3	254.2	65	153	65
PECOS DRAINAGE															
Alamogordo	148.0	--	--	--	--	11.2	95.6	50.2	41.4	129.8	89.4	69.6	60	128	60
McMillan		9.2	2.8	11.0	13.3	6.7	14.7	9.8	35.9	30.8	20.3	15.5	63	131	
Avalon		0.4	1.8	3.4	1.9	1.8	3.0	0.8	4.7	5.1	0.8	2.4	9	33	

\bar{p} Some averages for shorter periods.

*Based on capacity of 2,407,100 acre-feet.

